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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,920	02/02/2001	James J. Alwan	100.718.419 (MIC- 77US)	8909
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RAJESH VALLABH, ESQ. HALE & DORR, LLP 60 STATE STREET BOSTON, MA 02109				
EXAMINER MACCHIAROLO, PETER J				
ART UNIT		PAPER NUMBER		
2875				

DATE MAILED: 01/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/775,920

Applicant(s)

ALWAN, JAMES J.

Examiner

Peter J Macchiarolo

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The reply filed on September 24, 2003 consists of changes to the specification, drawings, and to the claims, and further, the reply consists of remarks related to the prior rejection of claims in the First Office Action. However, claims 1-32 are not allowable as explained below.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. The claims recite many limitations that are still not shown in the drawings. For example:

- a. locally applying an etchant as recited in claim 1 must be shown;
- b. selectively directing an etchant as recited in claim 8 must be shown;
- c. locally applying an etchant as recited in claim 13 must be shown;
- d. locally applying an etchant as recited in claim 17 must be shown;
- e. selectively spraying a wet etchant and rinsing a residual etchant as recited in claim 27 must be shown or the feature(s) canceled from the claim(s);

3. No new matter should be entered.

4. The Examiner respectfully disagrees with Applicant that these steps are shown in the figures, and invites Applicant to point out the corresponding reference numerals. The Examiner appreciates the fact that a flat panel display device structure is shown, but the claimed method steps are not. The Examiner respectfully notes that showing claimed limitations is a statute requirement and Applicant will not be permitted to obtain a patent without showing the claimed

method steps. **New figures must be presented in the application that shows the above claim limitations.** This point cannot be argued, nor can Applicant solely rely on the specification to describe these claim limitations when they can be illustrated.

5. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The instant specification does not give proper antecedent basis for the structures in the higher resolution region. The Examiner is interpreting the structures to be pixels (i.e. shown in fig. 1 /28,18).

Claim Objections

7. Claim 17 is objected to because of the following informalities: The claim recites making an anode assembly includes locally applying an etchant to uncover a structure in the peripheral region of the **cathode** assembly. This is being interpreted as the anode assembly. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 20-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.**

3. The claim(s) contains subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

4. Claims 20 and 25 recite the limitation “forming alignment marks on the peripheral area of the substrate.” However, the specification does not describe this limitation in such a way as to enable one skilled in the art to which it pertains to form the alignment marks. The specification does not state if the alignment marks of this invention are formed by etching, or deposited using an ink-type or similar method. If the alignment marks are formed by etching, then the Examiner is unsure how locally applying a wet etch will remove the debris without permanently damaging the alignment mark and ultimately, the device.

5. Claims 21-24, and 26 depend from claims 20 and 25 respectfully, and are therefore also rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-19, 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu et al (USPN 5,271,798; "Sandhu").

9. In regards to claims 1 and 8, Sandhu discloses in figures 1-3 and in the abstract, a method for removing material (tungsten) covering a structure component (silicon wafer), comprising directing an etchant on the tungsten covering the silicon wafer in a peripheral area without directing etchant toward an active display area, and locally applying the etchant on the material covering the structure to facilitate further processing.

10. Sandhu is silent to the processing of a flat panel display.

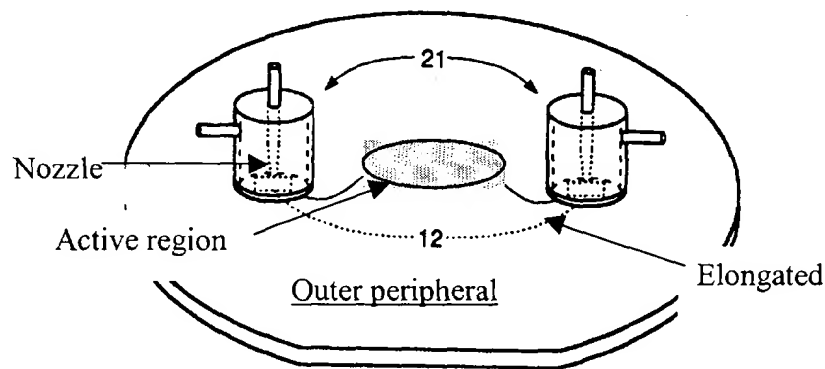
11. However, this limitation is an intended use type limitation. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

12. Further, Sandhu's etchant process for removing debris over the alignment marks, which is directed to semiconductor processing, can easily be used in a manufacturing process for a flat panel display. These processes have the same problems (i.e. debris over the alignment marks), and Sandhu's process effectively removes the debris over a silicon wafer, whereas applicant

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removes debris over a substrate. One of ordinary skill in the art would be motivated to use Sandhu's process for manufacturing a flat panel display for a variety of reasons, including material availability and reduced research time.

13. Therefore, according to the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture Applicant's flat panel display, using Sandhu's method.



14. In regards to claims 2-5, and 9-11, Sandhu discloses all of the recited limitations of claim 1 (above), and further discloses that tungsten residue is the desired etchant target. Sandhu further discloses that the structure comprises alignment marks (12), and locally applying an etchant comprises providing a localized spray of wet etchant over the structure¹. Sandhu further discloses in figure 4 that applying an etchant comprises applying the etchant along an elongated zone over a plurality of structures (11).

15. Sandhu is silent to the structure comprising a bond pad, or the material comprising a passivation layer.

16. However, a flat panel display device including a bond pad and a passivation layer is well known in the art, as evidenced by Applicant on page 8 lines 15-16 of the instant specification. And one of ordinary skill in the art will recognize that Sandhu's method can be applied to any substrate that requires to be etched (i.e. a flat panel display with a structure). One of ordinary skill in the art would be motivated to include a bond pad and a passivation layer, since bond pads will help electrify the flat panel display and passivation layers are needed to protect the bond pads from harmful manufacturing procedures, and this configuration will reduce overall manufacturing time.

17. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the flat panel display using Sandhu's etchant method, and the display includes bond pads.

18. In regards to claim 6, Sandhu discloses all of the recited limitations of claim 5 (above).

19. Sandhu is silent to applying the etchant while moving one of the nozzle and the device relative to the other.

20. Further, using an etchant while moving the nozzle is an obvious method of manufacture to apply etchant to an elongated zone, since this will reduce the time needed to etch the elongated zone, and consequently, will reduce the overall cost of manufacturing the device.

21. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture a flat panel display

¹ Sandhu, col. 2 ll. 66-68.

with the method of Sandhu, including moving one of the nozzle and the device relative to the other.

22. In regards to claims 7 and 12, Sandhu teaches all of the recited limitations of claims 1 and 8 (above). Sandhu further shows that the device includes a central active region and an outer region, wherein the structure is located in the outer region.

23. Sandhu is silent to the central active region including structures of higher resolution than those in the outer region.

24. However, this is a well known structure of an FED, i.e. the pixels of an FED (central active region structures) are more numerous than the alignment marks. Further, one of ordinary skill in the art would be motivated to construct this FED configuration for a variety of reasons, including reducing the overall time and money needed to manufacture the FED. For example, alignment marks numbering fewer than the pixels will reduce the steps involved in manufacturing the device.

25. In regards to claims 13 and 17, Sandhu discloses a method comprising a step of locally applying a wet etchant to uncover a structure in the peripheral region of a substrate.

26. Sandhu is silent to the method being applied to an FED having a central active display area and a surrounding peripheral region, with a cathode and anode assembly.

27. However, as Applicant has illustrated in figure 1 and recited at page 13, IV, a FED having a cathode and anode assembly assembled together with alignment marks formed on the periphery is well known in the art. Therefore, simply modifying Sandhu's method to clear debris

from the alignment marks of the well known FED would be an obvious modification, since it is well known that the alignment marks must be discernable to a stepper to precisely align different masks. Furthermore, one of ordinary skill in the art would be motivated to use Sandhu's method for etching a FED for a variety of reasons, including material availability.

28. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the well-known FED using Sandhu's method.

29. Further, it would have been an obvious matter of design choice use Sandhu's method for manufacturing a FED, since Applicant has not adequately disclosed any testing or analytical data which establishes criticality for this method, or recites any specific advantage the invention benefits from over the prior art from this method. It appears that Sandhu's method would perform equally well when being used on a FED.

30. In regards to claims 14-16, 18, and 19, the rejections for these claims are the same as the rejections to claims 2-4 (above).

31. In regards to claims 27-29, and 32, Sandhu discloses in figures 1-3 and in the abstract, a method for removing material (tungsten) covering a structure (silicon wafer) comprising, selectively spraying a wet etchant in localized fashion over the structure while limiting spraying of the etchant on the central active region.

32. Sandhu is silent to the structure comprising comprises a flat panel FED display, or thereafter rinsing residual etchant from the device.

33. However, Sandhu's etchant process for removing debris, which is directed to semiconductor processing, can easily be used in a manufacturing process for a flat panel FED display, by selectively etching bond pads, alignment marks, or passivation layers covering bond pads (which are known in flat panel display. See paragraph 14, above and IV. In Applicant's arguments) instead of Sandhu's tungsten. These methods suffer from the same problems (i.e. debris over an element), and Sandhu's process, although directed to removing debris over a silicon wafer, can effectively remove passivation layers over a bond pad or alignment mark in a flat panel display. One of ordinary skill in the art would be motivated to use Sandhu's process for manufacturing a flat panel display for a variety of reasons, including material availability, and further, using Sandhu's process will reduced the time needed to research another suitable manufacturing process.

34. Furthermore, rinsing the residual etchant is an obvious step that may or may not be employed, depending on the design of the structure and type of etchant. Other types of residual etchant removal may be used, such as the suction method as disclosed by Sandhu. One of ordinary skill in the art would be motivated to rinse the residual etchant from the device for a variety of reasons, including material and machine availability.

35. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture a flat panel display with the method of Sandhu, including rinsing the residual etchant.

36. In regards to claims 30-31, the rejections for these claims are the same as the rejections to claims 5 and 6 (above).

Response to Arguments

37. Applicant's arguments filed October 28, 2002 have been fully considered but they are not persuasive.

38. In regards to the rejection under 35 U.S.C. 112, first paragraph, the Applicant alleges at page 13/IV, that processes for forming alignment marks are well known in the art. The Examiner appreciates this statement, however, points out that there are numerous processes known in the art to make alignment marks, such as using an ink jet, and etching recesses. See for example, U.S. Patents 4,349,742 to Flurry et al, and 5,017,266 to Zdeblick et al. If one makes the alignment marks via an etching process, then the Examiner is unsure how Applicant's method will remove the debris in the recessed alignment mark without permanently damaging the substrate. The Examiner respectfully affirms that there is not enough discussion in the specification to enable one skilled in the art to manufacture the FED while using the recited method.

39. Furthermore, Applicant's amendments to claims 1, 8, 13, 17, and 27 necessitated the new grounds of rejection presented in this Office action.

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

41. U.S. Patent 3,597,289 to Köhl et al is evidence that it is obvious to move the nozzle relative to the device while applying a wet etchant to an elongated zone, followed by rinsing the residual etchant from the device.

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42. U.S. Patents 6,283,813 to Kaneko et al and 5,695,658 to Alwan are evidence that a central region including pixels has a higher resolution than the periphery.

43. U.S. Patents 5,064,396 to Spindt is further evidence that assembling cathode and anode assemblies of an FED are known.

44. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

45. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

46. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (703) 305-7198. The examiner can normally be reached on 7.30 - 4:30, M-F.

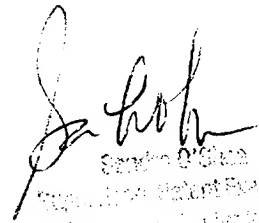
47. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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48. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pjm



Sandra O'Shea
Supervisor, Patent Examination
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